

traverses the rejection because the Official Action has not made a *prima facie* case of obviousness.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims. The present invention relates to a method for manufacturing a semiconductor apparatus. The method comprises forming a mask comprising a resist over a semiconductor to overlap with a portion of the semiconductor. The method further comprises adding an impurity element to the semiconductor in accordance with the mask. The claims have numerical value limitations for a mask area proportion. For example, in claim 1, an area of the mask is at most 15% of an area of the substrate. The other claims include specific percentages (*i.e.* at most 15%, at most 35%, at most 20% for one mask and at most 15% for another, or at most 40% for one mask and at most 35% for another) for the area of the mask with respect to the

substrate. For the reasons provided below, Yamazaki and Jaeger, either alone or in combination, do not teach or suggest the above-referenced features of the present invention.

Initially, please incorporate by reference the detailed arguments presented in pages 2-4 of the Applicant's *Response* filed June 23, 2006.

In a transistor, a source region or a drain region can be formed by adding an impurity using a mask. However, as argued in detail in the Applicant's *Response* filed June 23, 2006, there are problems when a resist, which is generally used as a mask, is degassed by ion beam irradiation. Due to this, pressure in a treatment chamber is increased, it becomes impossible to irradiate the ion beam, and an injection amount of impurities has a margin of error. The present invention recognizes and solves the degassing problem by adjusting an area of a resist mask.

In the "Response to Arguments" section, the Official Action asserts that "the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious" (page 3, Paper No. 20060918).

However, the Official Action has not shown that one of ordinary skill in the art at the time of the present invention; upon consulting Yamazaki and Jaeger, would have had any concern over the area of a mask with respect to a substrate, much less that such area should be at a ratio of at most 15%, at most 35%, at most 20% for one mask and at most 15% for another, or at most 40% for one mask and at most 35% for another with respect to the substrate. The prior art does not even teach that the area of a mask should be limited with respect to a substrate. Also, the Official Action has not shown that differences between the alleged combined device of Yamazaki and Jaeger would have otherwise been obvious to one of ordinary skill in the art at the time of the present invention. The Official Action concedes that "Yamazaki fails to disclose the mask precise parameters of the mask area." That is, the Official Action concedes that Yamazaki does not teach that an area of a mask is at most 15%, at most 35%, at most

20% for one mask and at most 15% for another, or at most 40% for one mask and at most 35% for another with respect to an area of a substrate. Yamazaki merely teaches use of a mask 201 (Figure 4C). Yamazaki is completely silent as to any problem with a mask or that an area of a mask should be limited with respect to an area of a substrate. These differences between Yamazaki and the present claims are not merely obvious differences.

In order to form a *prima facie* case of obviousness, the Official Action would have to set forth evidence that one of ordinary skill in the art at the time of the present invention would have had motivation to first recognize a problem with the mask 201 in Figure 4C of Yamazaki, then decide that the area of the mask should be limited, and, further, that the frame of reference for comparison of the area of mask should be as compared to the area of the substrate. However, the Official Action has not demonstrated why one of ordinary skill in the art would have been concerned with modifying the area of the mask with respect to the area of the substrate.

Jaeger fails to cure the deficiencies in Yamazaki. Jaeger simply does not teach or suggest that one of ordinary skill would have recognized any problem with the mask 201 in Figure 4C of Yamazaki, much less decide that the area of the mask should be limited, and, further, that the frame of reference for comparison of the area of mask should be as compared to the area of the substrate.

The Official Action asserts that Jaeger teaches that "modulating the mask area is very well known in the art" (page 2, Paper No. 20060918). However, Jaeger merely teaches the use of positive and negative resists. Jaeger does not discuss a problem with a mask of the type shown, for example, in Figure 4C of Yamazaki. Even if it were "well known" to modulate mask area, Jaeger, at best, teaches use of positive or negative resists, not a determination of a specific ratio of a mask area with respect to a substrate area. The Official Action has not shown that Jaeger teaches or suggests that an area of a mask should be limited or that an area of a mask should be compared to an area of a substrate. The Official Action has not shown that Jaeger does anything to

advance the teachings set forth in Yamazaki or that Yamazaki should be modified in a manner that would render obvious any of the present claims.

Even if one were motivated to combine Yamazaki and Jaeger, the Official Action has not demonstrated why one would have been motivated to further modify the resulting combination so that an area of a mask is necessarily limited with respect to an area of a substrate, much less that such area should be at most 15%, at most 35%, at most 20% for one mask and at most 15% for another, or at most 40% for one mask and at most 35% for another with respect to a substrate.

Therefore, Yamazaki and Jaeger do not teach or suggest a method for manufacturing a semiconductor apparatus, the method comprises forming a mask comprising a resist over a semiconductor to overlap with a portion of the semiconductor; adding an impurity element to the semiconductor in accordance with the mask, where an area of the mask is at most 15%, at most 35%, at most 20% for one mask and at most 15% for another, or at most 40% for one mask and at most 35% for another with respect to a substrate.

Since Yamazaki and Jaeger do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

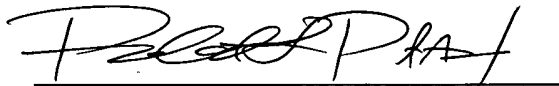
The Official Action rejects dependent claims 20-27 as obvious based on the combination of Yamazaki and U.S. Patent Application Publication No. 2005/0011455 to Yamamoto.

Yamamoto does not cure the deficiencies in Yamazaki and Jaeger. The Official Action relies on Yamamoto to allegedly teach the features of the dependent claims. Specifically, the Official Action relies on Yamamoto to allegedly teach a substrate with an area of one square meter (page 3, Paper No. 20060320). However, Yamazaki, Jaeger and Yamamoto, either alone or in combination, do not teach or suggest a method for manufacturing a semiconductor apparatus, the method comprises forming a

mask comprising a resist over a semiconductor to overlap with a portion of the semiconductor; adding an impurity element to the semiconductor in accordance with the mask, where an area of the mask is at most 15%, at most 35%, at most 20% for one mask and at most 15% for another, or at most 40% for one mask and at most 35% for another with respect to a substrate. Since Yamazaki and Jaeger and Yamamoto do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'R. L. Pilaud', written over a horizontal line.

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